WHAT IS CLAIMED IS:

1. A method for predicting signal peaks in data in a circuit comprising the steps of:

creating a behavioral model of filters in transmit path of said circuit;

applying said behavioral model to a copy of said data, producing applied data;

selecting a data point in said applied data with largest magnitude;

comparing said data point with a threshold; and

outputting results of said comparison.

2. A method according to Claim 1, wherein:

said data is frequency domain data;

said behavioral model of filters is a frequency response estimate of filters in transmit path of said circuit;

said step of applying said behavioral model to the copy of said data is multiplying said frequency response estimate with the copy of said data;

said step of comparing said data point with a threshold is with converted time data; and

said method further comprising the step of converting said applied data into a time domain representation of same, producing said converted time data.

3. A method according to Claim 2, further comprising the step of upsampling said copy of said data.

4. A method according to Claim 2, wherein:

said step of applying said behavioral model to the copy of said data is done to a symbol of said data at a time, creating an applied data symbol;

said method further comprising the steps of:

partitioning said data into symbols;

saving said applied data symbol; and

adding said applied data symbol with said applied data symbol generated from previous symbol.

5. A method according to Claim 4, further comprising the step of upsampling said copy of said data.

6. A method according to Claim 1, wherein:

said data is time domain data;

said behavioral model of filters is a time response estimate of filters in transmit path of said circuit; and

said step of applying said behavioral model to said copy of said data is convolving said time response estimate with the copy of said data.

7. A method according to Claim 6, further comprising the step of upsampling said copy of said data.

8. A method for peak reduction of data in a circuit comprising the steps of:

creating a behavioral model of filters in transmit path of said circuit;

applying said behavioral model to a copy of said data, producing applied data;

selecting a data point in said applied data with largest magnitude;

comparing said data point with a threshold; and

scaling magnitude of said data if said data point exceeds said threshold.

9. A method according to Claim 8, wherein:

said data is frequency domain data;

said behavioral model of filters is a frequency response estimate of filters in transmit path of said circuit;

said step of comparing said data point with a threshold is with converted time data;

said step of applying said behavioral model to a copy of said data is multiplying said frequency response estimate with the copy of said data; and

said method further comprising the step of converting said applied data into a time domain representation of same, producing said converted time data.

10. A method according to Claim 9, further comprising the step of upsampling said copy of said data.

11. A method according to Claim 9, wherein:

said step of applying said behavioral model to the copy of said data is done to a symbol of said data at a time, creating an applied data symbol;

said method further comprising the steps of:

partitioning said data into symbols;

saving said applied data symbols; and

adding said applied data symbol with said applied data symbol generated from previous symbol.

12. A method according to Claim 11, further comprising the step of upsampling said copy of said data.

13. A method according to Claim 8, wherein:

said data is time domain data;

said behavioral model of filters is a time response estimate of filters in transmit path of said circuit; and

said step of applying said behavioral model to the copy of said data is convolving said time response estimate with the copy of said data.

14. A method according to Claim 13, further comprising the step of upsampling said copy of said data.

15. An apparatus for peak prediction in a circuit comprising:

a data input, adapted to inputting data;

a behavior model of filters in transmit path of said circuit;

an application circuit, having a first input coupled to said data input and a second input coupled to said behavior model and an output coupled to a comparator, adapted to applying said behavior model to said data, producing applied data;

said comparator, having an input coupled to said output of said application circuit and an output coupled to an apparatus output, adapted to selecting a data point from said applied data with a largest magnitude and comparing said data point with a threshold value; and

said apparatus output, outputting result of said comparator.

16. An apparatus according to Claim 15, wherein said data is partitioned into 512 data point symbols and represents 232 microseconds of time.

17. An apparatus according to Claim 15, wherein:

said data is frequency domain data;

said behavior model of filters is a frequency response estimate of filters in transmit path of said circuit;

said application circuit is a multiplier, having a first input coupled to said frequency response estimate and a second input coupled to said data, adapted to multiplying said frequency response estimate with said data; and

said apparatus further comprising an inverse Fast Fourier Transform (FFT) circuit, having an input coupled to said output of said application circuit and an output coupled to said input of said comparator, adapted to converting said applied data into time domain representation of same.

18. An apparatus according to Claim 17, further comprising an upsample circuit, having an input coupled to said data input and an output coupled to said first input of said multiplier, adapted to upsample a copy of said data.

19. An apparatus according to Claim 18, wherein said upsample circuit upsamples said data by calculating a complex conjugate of said data and then flipping said complex conjugate.

20. An apparatus according to Claim 18, wherein a number of upsampled data images are set to zero to reduce computation complexity and increase computation speed in said inverse FFT circuit.

21. An apparatus according to Claim 15, wherein:

said data is time domain data;

said behavior model of filters is a time response estimate of filters in

transmit path of said circuit; and

said application circuit is a convolution circuit, having a first input coupled to said time response estimate and a second input coupled to said data, adapted to convolving said time response estimate with said data.

22. An apparatus according to Claim 21, further comprising an upsample circuit, having an input coupled to said data input and an output coupled to said first input of said multiplier, adapted to upsample a copy of said data.

23. An apparatus for peak reduction in a circuit comprising:

a data input, adapted to inputting user data;

an apparatus output;

a behavior model of filters in transmit path of said circuit;

an application circuit, having a first input coupled to said data input and a second input coupled to said behavior model and an output coupled to a comparator, adapted to applying said behavior model to said user data, producing applied data;

said comparator, having an input coupled to said application circuit and an output coupled to a scaling circuit, adapted to selecting a data point from said applied data with a largest magnitude and comparing said data point with a threshold value; and

said scaling circuit, having a first input coupled to said data input and a second input coupled to said comparator and an output coupled to said apparatus output, adapted to scaling the magnitude of said applied data if said comparator determines that said data point exceeds said threshold value, outputting said applied data if said comparator determines that said data point does not exceed said threshold value and a scaled version of

said applied data if said comparator determines that said data point does exceed threshold value.

24. An apparatus according to Claim 23, wherein:

said data is frequency domain data;

said behavior model of filters is a frequency response estimate of filters in transmit path of said circuit;

said application circuit is a multiplier, having a first input coupled to said frequency response estimate and a second input coupled to said data, adapted to multiplying said frequency response estimate with said data;

said apparatus further comprising:

a first inverse Fast Fourier Transform (FFT) circuit, having an input coupled to said output of said application circuit and an output coupled to said input of said comparator, adapted to converting said applied data into time domain representation of same;

a second inverse FFT circuit having an input coupled to said data input and an output coupled to said first input of said scaling circuit, adapted to converting said data into a time domain representation of same, producing applied data.

25. An apparatus according to Claim 24, further comprising an upsample circuit, having an input coupled to said data input and an output coupled to said first input of said application circuit, adapted to upsample a copy of said data.

26. An apparatus according to Claim 23, wherein:

said data is time domain data;

said behavior model of filters is a time response estimate of filters in

transmit path of said circuit; and

said application circuit is a convolution circuit, having a first input coupled to said time response estimate and a second input coupled to said data, adapted to convolving said time response estimate with said data.

27. An apparatus according to Claim 26 further comprising an upsampling circuit, having an input coupled to said data input and an output coupled to said first input of said application circuit, adapted to upsample a copy of said data.

28. An apparatus according to Claim 23, wherein said scaling circuit scales said signal in one decibel (dB) increments in a downward direction.

29. A data transmission system with built-in circuitry for reducing a peak-to-average ratio in said data comprising:

a data input, adapted to inputting user data;

a symbol encoder, having an input coupled to said data input and an output coupled to a scaling circuit and an apparatus input, adapted to encode data from said data input into a data symbol;

said scaling circuit, having a first input coupled to said symbol encoder and a second input coupled to an apparatus output of an apparatus for predicting signal peaks and an output coupled to a data output, adapted to reducing magnitude of said data symbol if said apparatus predicts a signal peak exceeding a threshold value, outputting said data symbol if said apparatus does not predict a signal peak exceeding said threshold value and a scaled version of said data symbol if said apparatus does predict a signal peak exceeding said threshold value;

said data output, coupled to said scaling circuit, adapted to outputting

said output of said scaling circuit;

wherein said apparatus for predicting signal peaks, having said apparatus input coupled to said output of said symbol encoder and said apparatus output coupled to said second input of said scaling circuit, further comprising:

a behavior model of filters in transmit path of said data transmission system;

an application circuit, having a first input coupled to said apparatus input and a second input coupled to said behavior model and an output coupled to a comparator, adapted to applying said behavior model to said data symbol, producing applied data;

said comparator, having an input coupled to said application circuit and an output coupled to said apparatus output, adapted to selecting a data point from said applied data with a largest magnitude and comparing said data point with said threshold value; and

said apparatus output, adapted to outputting result of said comparator.

30. An apparatus according to Claim 29, wherein:

said data is frequency domain data;

said behavior model of filters is a frequency response estimate of filters in transmit path of said circuit;

said application circuit is a multiplier, having a first input coupled to said frequency response estimate and a second input coupled to said data, adapted to multiplying said frequency response estimate with said data;

said apparatus further comprising:

a first inverse FFT circuit, having an input coupled to said output of said application circuit and an output coupled to said input of said

comparator, adapted to converting said applied data into time domain representation of same; and

a second inverse FFT circuit having an input coupled to said data input and an output coupled to said first input of said scaling circuit, adapted to converting said data into a time domain representation of same, producing applied data.

31. An apparatus according to Claim 30, further comprising an upsample circuit, having an input coupled to said output of said symbol encoder and an output coupled to said first input of said application circuit, adapted to upsample a copy of said data.

32. An apparatus according to Claim 29, wherein:

said data is time domain data;

said behavior model of filters is a time response estimate of filters in transmit path of said circuit;

said application circuit is a convolution circuit, having a first input coupled to said time response estimate and a second input coupled to said data, adapted to convolving said time response estimate with said data; and

wherein said data transmission system further comprised of an inverse FFT circuit, having an input coupled to said output of said symbol encoder and an output coupled to said first input of said scaling circuit and said second input of said application circuit, adapted to converting said data into a time domain representation of same, producing a data symbol.

33. An apparatus according to Claim 32 further comprising an upsampling circuit, having an input coupled to said data input and an output

coupled to said first input of said application circuit, adapted to upsample a copy of said data.

34. An apparatus of claim 29 wherein said data output further comprising:

a digital filter, having an input coupled to said output of said scaling circuit and an output coupled to an upsample and interpolation circuit, adapted to filtering said data output;

said upsample and interpolation circuit, having an input coupled to said digital filter and an output coupled to a digital-to-analog converter circuit, adapted to upsampling and interpolating said data output;

said digital-to-analog converter circuit, having an input coupled to said upsample and interpolation circuit and an output coupled to an analog filter; adapted to converting said data output into an analog representation of same;

said analog filter, having an input coupled to said digital-to-analog converter circuit and an output coupled to an amplifier, adapted to filtering said analog data output; and

said amplifier; having an input coupled to said analog filter and an output coupled to a transmission medium, adapted to amplifying said analog data output to a specified magnitude.